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ABSTRACT

This Vocational Instructional Management System module provides information regarding instructional/teaching strategies and cognitive/learning strategies as well as other information for successful learning to assist Missouri building trades teachers and special needs students in confronting building trades competencies with a strategic plan. Ten definitions, 11 frequently asked questions, 2 resources, and 5 references are included. The following questions are answered: What types of strategies might be used? Why should I teach strategies? Who needs to be taught strategies? How often do I need to use strategies? How do I include instructional strategies in my daily lessons? What strategies can both students and teachers use? How does paraphrasing work as a learning strategy? What strategies will help with reading comprehension? What is reciprocal teaching? How can I teach students tools of measurement? and What are some additional materials that I can use with my class to teach building trades? (three sources are listed). The following resources are included: (1) sample study guide; and (2) bridging example. (NLA)

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Strategies for Learners With Special Needs in Building Trades

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Abstract

This module provides information regarding Instructional/Teaching Strategies and Cooperative Learning Strategies as well as other information for successful learning to occur. It helps assist teachers and students in completing building trade competencies with a strategic plan.

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Overview

There are many types of strategies utilized in classrooms today. In this module, *Strategies for Learners With Special Needs in Building Trades*, suggestions and examples will be given on how to teach specific VIMS competencies or Access Skills to students with special needs who are enrolled in a building trades class. Some of these examples will show how students will be able to help themselves learn better. An additional module, *Strategies for Students with Special Needs*, will provide background information on the various kinds of strategies, examples of strategies and how to teach strategies to students.

Definitions

Access Skills	Prevocational skills that may help a student be successful in a given vocational curriculum. Also, the generic name for Missouri LINC's prevocational supplemental curriculum.
Bridging	Bridging is a strategy which helps a student relate learned information to life. It helps a student to plan, question and monitor their use of strategies.
Multipass	Multipass is a strategy, similar to SQ3R, which was developed by the University of Kansas Institute for Learning Disabled Students (Schumaker, et al., 1982). This strategy emphasizes three "passes" which students should utilize when reading new information.
Paraphrasing	Paraphrasing may be a very successful strategy for the student who is an auditory learner. The student retells information that has just been taught by putting it into his own words. This helps facilitate storage of information and the ability to recall the information at a later date.
Reciprocal Teaching	This strategy lets the students be the teacher. Reciprocal teaching is a successful way of determining if a student knows the information by placing the student in the position of "expert" and letting her direct the class.
SQ3R	SQ3R is a reading strategy which helps students learn study skills by **S**urveying, **Q**uestioning, **R**eading, **R**eciting and **R**eviewing information that will be or has just been read or heard (Cheek & Cheek, 1983).
Strategy	A strategy is a planned, deliberate activity used to acquire knowledge (Reid, 1988).

Study Guides	A study guide is a good example of a strategy a teacher can use to teach students. Students can use a study guide to learn information being taught. Study guide is a general term for outlines, abstracts or questions that stress important information from the chapters that have been covered (Lovitt & Horton, 1987).
VIMS	The Vocational Instructional Management System is a competency based approach to vocational education that is used by vocational educators in Missouri.
Words on the Wall	The words on the wall strategy is used to help students learn new vocabulary words. It increases word recognition and provides a quick reference when students forget meanings. During this strategy, butcher paper (or other, if preferred) is hung on the wall. Throughout the unit of study, vocabulary words and their definitions are written upon the wall by the students.

Frequently Asked Questions

Q. What Types of Strategies Might be Used?

A. There are two major types of strategies: cognitive/learning and instructional/ teaching strategies.

Cognitive/learning strategies are those techniques the student uses to acquire knowledge. Students must be taught **how** to effectively acquire knowledge. Frequently students with special needs have acquired few if any real techniques for learning. Any techniques which have been acquired may be effective some of the time, but often are not effective and result in failure for the students in acquiring new information. Cognitive strategies enable students to confront new information and/or situations with various strategic plans which allow for successful learning.

Instructional/teaching strategies are techniques utilized by the teacher to enable students to learn. Instructional strategies include those activities the teacher plans in order to help students of all learning abilities to acquire the information being presented.

Q. Why Should I Teach Strategies?

A. All teachers should be concerned about the effectiveness of their teaching. By using strategies during the teaching process, you not only enhance your teaching style, but also help students enhance their learning abilities.

Q. Who Needs to be Taught Strategies?

A. Every student should be taught a variety of strategies. By using various instructional strategies, you will present information to students in many different ways and by teaching numerous cognitive strategies, students will be allowed to learn materials presented in a variety of ways.

Q. How Often do I Need to use Instructional Strategies?

A. Instructional strategies should be used in daily lessons. Determining which strategy to use depends upon its appropriateness for the material that is being taught and student needs or previous experiences. Since there are a number of instructional strategies, remember to utilize a variety of methods. It is also important to keep in mind the learning styles of each student in order to provide students opportunities to learn through any method.

Q. How do I Include Instructional Strategies in my Daily Lessons?

A. When planning lessons, decide what you wish to teach. Since many of the instructional strategies can be adapted to different objectives or competencies that are being taught, it is just a matter of selecting a variety of those which suit the students' learning style and needs, as well as your teaching style.

Q. What is a Strategy That Both my Students and I can use When Working With A VIMS Competency in Building Trades?

A. A study guide is a good example of a strategy a teacher can use to teach students. Students can use a study guide to learn information being taught. Study guide is a general term for outlines, abstracts or questions that stress important information from the chapters that have been covered (Lovitt & Horton, 1987). A teacher can develop a study guide by compiling information from the following guidelines:

2. Mark the important vocabulary, facts and concepts that should be learned during class.
3. Divide the chapter into sections of 1,000 to 1,500 word segments. Try to divide the chapter into sections where it makes sense to stop and only include material that is important.
4. Write brief questions or statements about main ideas, vocabulary words, facts or concepts that you will be testing later.
5. Put the questions or statements in the order that follows the materials.
6. Use creativity when developing a study guide. Include such things as fill in the blank, definition of vocabulary words, matching, short answer, etc.
7. For fill in the blank, you could provide students with a list of words to choose from.
8. Put page numbers next to questions and statements so that students will be able to locate the information. **The use of a study guide is not meant to be difficult, but instead should help the student to study information that is valuable to know.**

An example of a building trades teacher using a study guide might occur when teaching the VIMS competency (460201A004); identify proper use of power and hand tools (see example of study guide in Resources). The steps to using a study guide as an instructional strategy are few. First, assign students the pages to read in the text that will be covered in the study guide and the test. After the students have read the material on various hand and power tools, allow them to discuss the material. Provide the actual hand and power tools for students to explore. Let students handle the tools (if possible) while they are not connected to power. This will help students learn how each tool looks and feels; it will help them complete diagrams on the study guide, on the test and better prepare them to handle these tools when they enter the shop. Once students have been permitted to explore the tools and discuss the reading material, give students the study guide. Arrange two to three days for students to continue to explore the tools while they complete the study guide. After this amount of time, require students to bring the study guide back to class.

This last step is very important: **during class supply students with the correct answers**. The purpose of the study guide is for students to study the correct material. You can give students the correct answers by using an overhead and asking students to supply the answers. Once a student has given the correct answer, write it on a copy of the study guide that has been made into an overhead transparency.

The study guide can also be used by the student as a learning strategy. The students can be taught the above steps and may eventually develop their own study guides to help them learn. Students can independently develop study guides, or as a class they may generate questions for possible test items. Students' questions can be combined to make a study guide, and the teacher can guide the discussion of items to make sure important information is included. The class can even take the use of a study guide a step farther by using it to play games for review before taking the test. For example, use the study guide to make a Jeopardy game. Students can review for the test by supplying questions to the answers.

Q. Exactly how Does Paraphrasing Work as a Learning Strategy?

A. Paraphrasing is when students are able to rephrase in their own words what they have heard. This strategy is very useful in making sure that students understand the lesson. Paraphrasing is a learning strategy. Students use this technique to help themselves learn. Paraphrasing might be used as a learning strategy when students are trying to learn to perform basic operations using fractions (Access Skill). It is important for students to know how to add, subtract, multiply and divide fractions before they enter a building trades program.

An example of using paraphrasing could occur when students are trying to learn to add two unlike fractions. While going through each step, ask the students to repeat the step back to you. The first step in learning to add two unlike fractions is for the teacher to show students the process. Begin by demonstrating how to find common denominators. Once the students have the common denominator, use the common denominator to make equal fractions. Next, have the students add the numerators and put that sum over the common denominator. The final step will be to reduce the fraction to simplest form.

Example:

1. The problem is: $\frac{1}{3} + \frac{1}{2}$

2. To find the lowest common denominator, find multiples of each denominator.

   3,**6**,9 2,4,**6**

3. The *l*owest *c*ommon *d*enominator (LCD) is 6.

4. Make equal fractions by dividing the old denominator into the new denominator.

   $\frac{6}{3} = 2$ $\frac{6}{2} = 3$

5. Then multiply that number by the original numerator (1) and place it over the LCD.

   $2 \times 1 = \frac{2}{6}$ $3 \times 1 = \frac{3}{6}$

6. Now add the equal fractions and simplify if needed.

   $\frac{2}{6} + \frac{3}{6} = \frac{5}{6}$

Once the students have been shown the process, offer them repeated practice of the steps on more problems while you assist. After this, divide the students into groups of two or three and let them practice paraphrasing the steps verbally to each other. This will help reinforce the learning process. The more students work with fraction concepts, the less they may need to paraphrase the above steps. Some will group steps into two or three verbal repeats. Others may continue to repeat steps separately; it will depend on the individual needs of the student.

Q. Are There Strategies That Will Help Building Trades Students With Reading Comprehension?

A. Words on the wall and multipass are two examples of learning strategies that may be used by students to increase reading comprehension. Once these strategies are taught and mastered by students, they can perform them without the guidance of the teacher.

The VIMS Competency 460201B001, reading and interpreting working drawings, begins with the basic understanding of building trades and the terminology that is used when discussing building trades. A learning strategy students might find useful in learning building trades vocabulary is words on the wall. A piece of butcher paper is posted on the classroom wall. Students write important words and definitions on this piece of paper as they are introduced to them when reading the text or through discussion. The students are allowed to add new words as the unit of study continues. This provides a quick reference for students and the daily visual display helps enhance learning.

Multipass is a learning strategy used by students to obtain information from written text (Schumaker, et al., 1982). This strategy emphasized three "passes" which students should use when they are reading. The passes are as follows:

> ***survey pass*** in which students initially skim only titles, headings, illustrations, chapter summary, etc. which they will be able to paraphrase.
>
> ***size-up pass*** in which students read chapter questions and determine which question they are unable to answer. Once those questions are located, the students then skim the chapter to locate the answer. They then paraphrase the answer without any assistance from the chapter.
>
> ***sort-out pass*** in which students test themselves to determine which questions they are unable to answer. The students, given a list of chapter questions, cross off questions to which they know the answer immediately and then return to the chapter to skim and locate answers to the remaining questions.

Most students would be able to learn these three passes and then apply them to various competencies. An example is the VIMS competency 460201A013, identifying purposes of building codes, zoning laws and building permits. Give the students written information on current building codes, zoning laws and building permits. Allow students to use multipass to locate information. The students can then use the strategy again when reviewing for a test.

Q. What is Reciprocal Teaching and how do I use It?

A. Reciprocal teaching is a strategy by which the student gets to be the teacher. By letting the student be in the position of "expert", you can determine if the information is known. For example, when teaching good safety practices (VIMS 460201A001) to your class, supply them with a list of desired procedures. Divide students into groups of two or three and give each their own safety practice to demonstrate. Assign someone in the group to be the "expert." Within the groups, the "expert" will lead the group in the discussion of the safety practice and the group as a whole will decide how to demonstrate this practice to the class. After 15-30 minutes of discussion, bring all the groups back together and allow each group to demonstrate the **do's** and **don'ts** of the practice. The students will learn from each other not only by watching others display good safety practices, but also by performing the safety practices themselves. This lesson could be continued by providing students with various hand and power tools and allowing them to use the teacher-made list to instruct each other about correct safety procedures with each given tool. Videotapes of these demonstrations could be utilized to check student progress, refresh student's memory or assist a new student who was not in class during safety instruction.

Q. What is a Strategy That I can use to Teach my Students Tools of Measurement?

A. Many students have had previous experience with measurement tools and it is important to find out what experience they have had when starting a unit of study on tools of measurement. Bridging is an excellent instructional strategy for this. In working with this Access Skill, applying basic measurement concepts, bridging can be used in the following way. Place a blank transparency on an overhead projector. At the top write the goal: ***Applying basic measurement concepts.*** Explain to the students that they are starting a unit on tools of measurement and ask them the following questions during a brainstorming session and write their answers on the overhead:

What are some tools of measure?

- Make sure they include tools they have used, as well as those they have only observed being used by others.
- This question will help you to see what tools students are already familiar with using.
- Provide examples of the various tools as they are mentioned.

What units of measure are involved?

- Ask them how each tool mentioned in the last question is broken down. What are the different units called?
- Notice if the students can locate different points on a ruler, for example.

What do these tools measure?

- Ask students why they would use the different tools?
- Let students match the different tools with situations.
- Allow students to reciprocal teach using the tools.
- The students will show you what they can do during this step.

In what ways can you use these tools?

- During this self-evaluation stage, students can check to see if they know how to use the different tools and when to use them.

In what ways can you distinguish between the various tools?

- How can the students tell the different tools apart?
- This stage helps to see what associations the students may have already made to the different tools.

In what classes would I get experience using these tools?

- Allow students to supply classes that they have taken or might take in the future where they will use these tools besides building trades.

When do I use these tools in my life?

- Again, allow students to brainstorm places and activities where they might have used the tools from the first question.

Since the purpose of bridging is to help the students see how the material relates to their lives, it is important to allow time for students to think of examples of where, when and how these tools have been used. They will need to draw upon their experiences to use bridging successfully. An example of how a completed bridging form might look following the above lesson is included at the end of this module. The answers will vary depending upon the students and the amount of exposure they have had to measurement. Related activities following the bridging exercise include supplying various objects the students could measure or weigh, providing students with situations where they will need to perform measurement conversion or introducing them to specific building trades measurement tools which were not covered. The choice of related activities will depend upon the level of knowledge/experience the students have shown with basic tools of measurement.

Q. What are Some Additional Resources That I Could use With my Class to Teach Building Trades?

A. There are many resources which can be used to teach strategies and/or building trades. Below are some examples:

Simon, B., Brasch, A., Brentz, C., Hoffman, M., Huston, C., Jacobs, N. & Kramer, B. (1981). *SPACE: Skill preparation and career exploration--Construction trades*. Town & Country, MO: Special School District of St. Louis County.

Boyer-Stephens, A. & Johnson, J. (1988). *Access skills: Vocational readiness skills series* (Trade and Technical I). Missouri LINC, University of Missouri-Columbia: Columbia, MO: Instructional Materials Laboratory.

Flanagan, M. & Johson, J. (1987). *Access skills: Employability and study skills assessment and curriculum guide*. Missouri LINC, University of Missouri-Columbia: Columbia, MO: Instructional Materials Laboratory.

Additional resources may be obtained for loan or purchase through:

Instructional Materials Laboratory (IML)
University of Missouri-Columbia
10 London Hall
Columbia, MO 65211

The Media Center
State Fair Community College
3201 West 16th Street
Sedalia, MO 65301

Midwest Curriculum Coordination Center
1500 W. 7th Ave.
Stillwater, OK 74074
(405) 377-2000

Resources

Sample Study Guide

Bridging Example

Sample: Study Guide

*****This sample study guide was developed using the Teacher's Guide version of this source: Hohhertz (1986).*

Unit II: Hand Tools and Equipment

Definition of Terms: (pg. 103-135)

T-bevel-

chisels-

wood rasp-

butt gauge-

ripping bar-

chalk line-

cabinet screwdriver-

Multiple Choice (pg. 103)

1) A _____ is the most used measuring device.

a) yardstick
b) folding wood rule
c) 12-inch rule
d) steel tape

2) A type of square used to check surfaces for squareness or to lay out lines perpendicular to an edge is called a _____ .

a) swanson speed
b) framing
c) combination
d) try square

3) When laying out vertical and horizontal lines two to six feet long, use a _____ level.

a) carpenter's
b) torpedo
c) line
d) transit-level

4) A level used in tight places is a _____.

a) transit-level
b) line
c) torpedo
d) carpenter's

Name and explain when to use the six types of pliers: (pg. 125)

1.

2.

3.

4.

5.

6.

MATCHING (pg. 103-113)

1. _____	T-bevel	A)	used to lay out lines parallel to a surface
2. _____	dividers	B)	all-purpose pliers
3. _____	scraper	C)	an adjustable bladed device used to transfer an angle from one piece to another
4. _____	marking gauge	D)	a line or string with a balanced weight used for checking vertical lines
5. _____	scratch awl	E)	a hooked, bladed tool used for removing thin layers of wood, paint, or other coating
6. _____	slip joint	F)	a tool with two pointed legs used to transfer measurements or scribe arcs and circles
7. _____	plumb bob	G)	used to scratch lines on the surface of material

Explain when each clamp or vise is used: (pg.125)

1. Hand-screw clamp--
2. C-clamp--
3. Bar clamp--
4. Wood vise--
5. Utility vise--

Name and explain the use of the six types of hammers: (pg. 135)

1.

2.

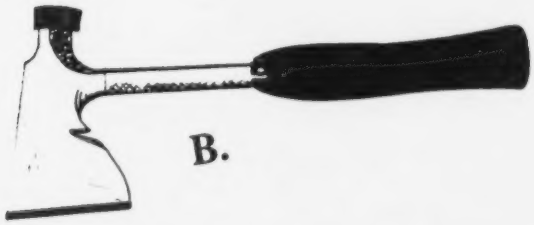
3.

4.

5.

6.

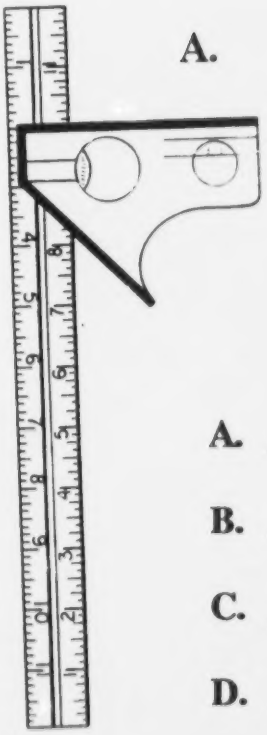
Name each of the following tools: (pg. 103-139)



B.

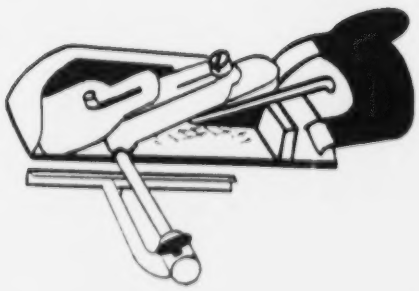
D.

C.



A.

E.



A. _____

B. _____

C. _____

D. _____

E. _____

Fill in each of the blanks below for the following safety procedures in using hand and power tools: (pg. 149-213)

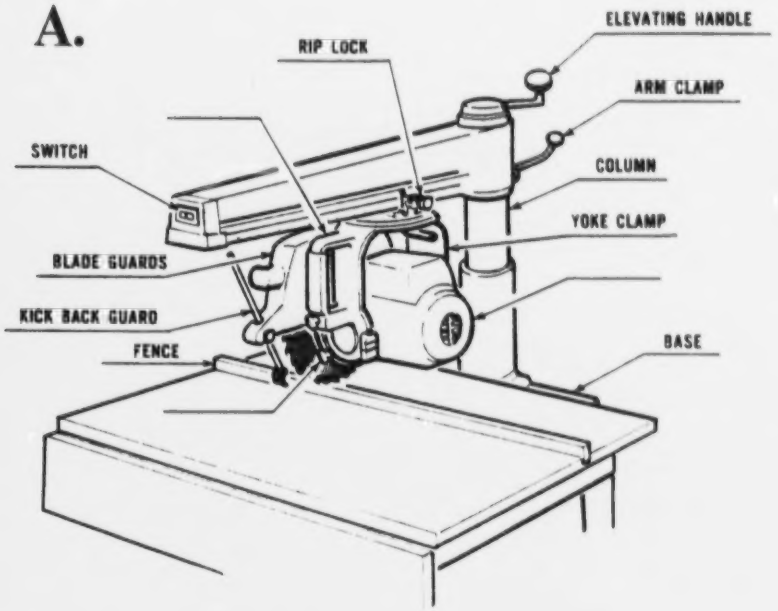
1. Select the correct _____ for your work and saw.
2. When using the power drill, do not hammer on the _____ _____.
3. Allow cutter to _____ before lifting the tool from work when using a router.
4. Lift the sander from the work _____ the sander stops.
5. _____ the sander before attaching sandpaper.
6. Allow the power plane to _____ before setting it down after completing a job.
7. When using a disc sander, keep the table _____ inch from the disc.
8. Drain the tank of an air compressor _____.
9. Allow the motor of the grinder to gain _____ speed before grinding.
10. Do not wear _____ or _____ _____ when using a drill press.
11. Check all _____ on adjustments before cutting with a table saw.
12. Pull the radial arm saw slowly _____ you when cutting across the board.
13. On a jointer, be sure the _____ _____ is in place and working correctly.
14. When using the bandsaw, use a push block when sawing _____ pieces.
15. When using the power miter box, raise the saw to its _____ position slowly after the cut is finished.

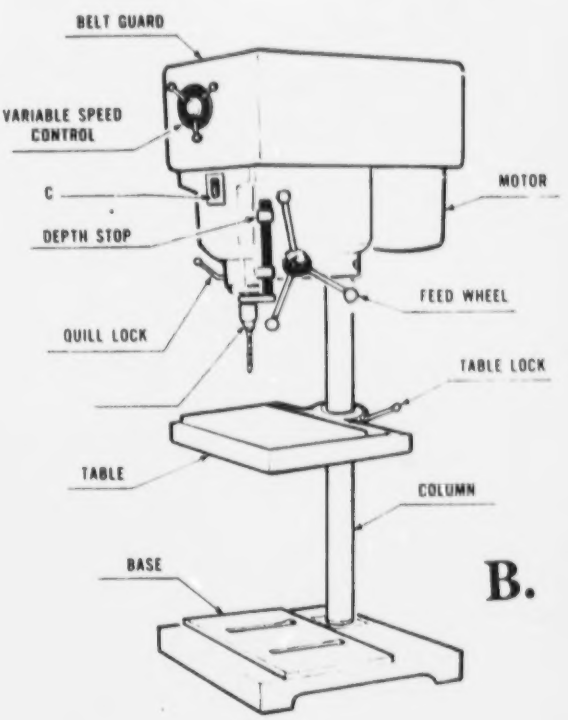
True/False: Mark **T** for true or **F** for false (pg. 177)

1. _____ Make all adjustments with the power **unplugged**.
2. _____ Be sure switch is **on** when plugging in equipment.
3. _____ No special clothing or equipment is required to operate tools.

The following pages are diagrams of power tools. Write the name of the power tool and the names of each part of the tool on the given lines. (pg. 149-213)

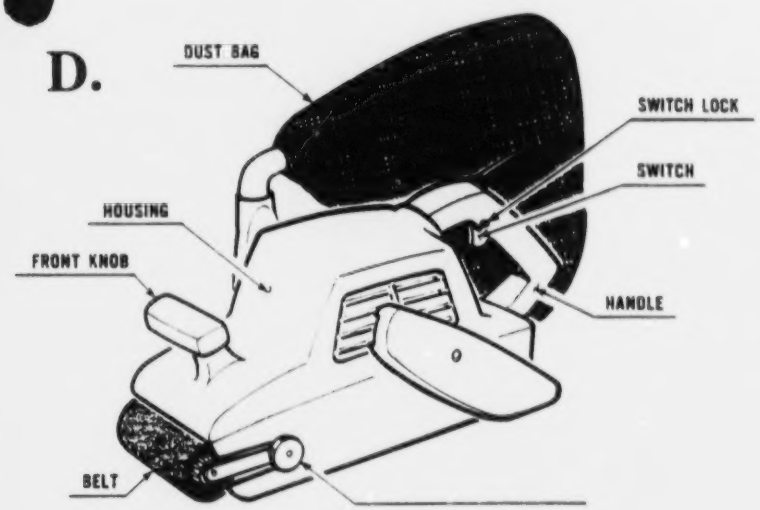
A.

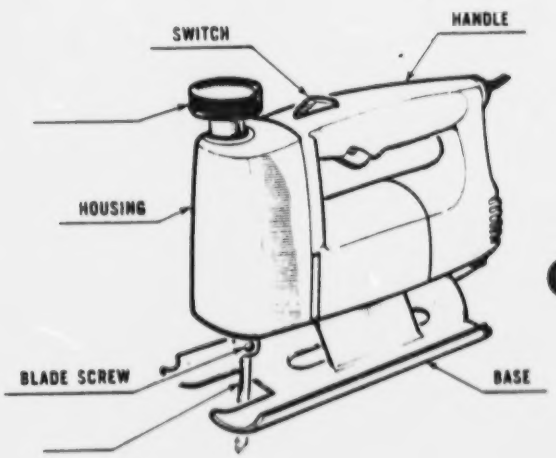




B.

D.





C.

A. _____

B. _____

C. _____

D. _____

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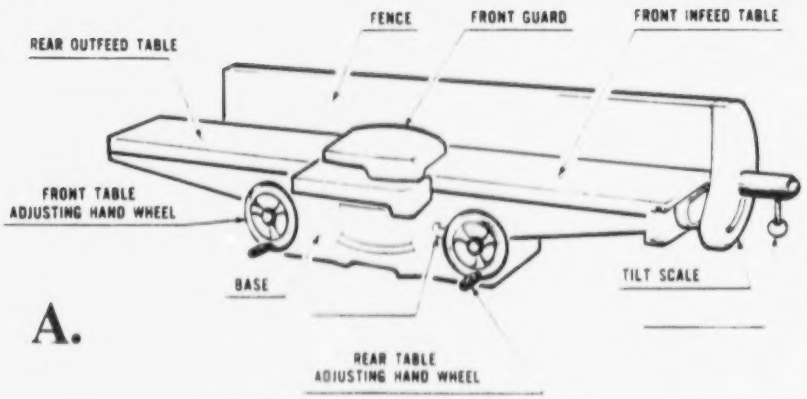

REAR OUTFEED TABLE
FENCE
FRONT GUARD
FRONT INFEED TABLE
FRONT TABLE ADJUSTING HAND WHEEL
BASE
TILT SCALE
REAR TABLE ADJUSTING HAND WHEEL

A.

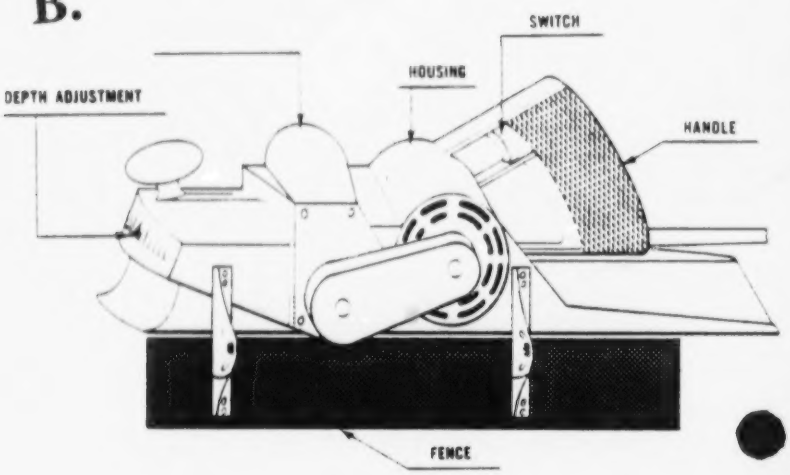
A. _____

B. _____

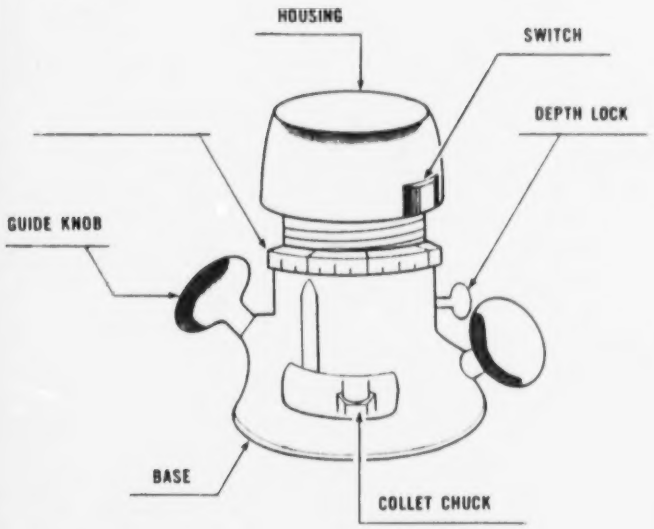
C. _____

D. _____

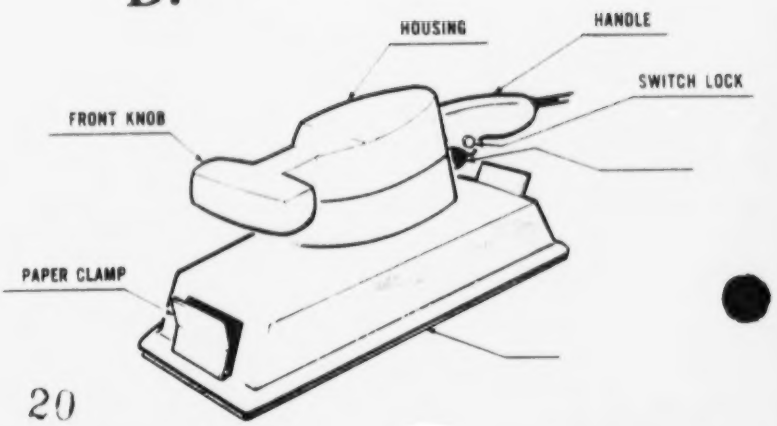
B.

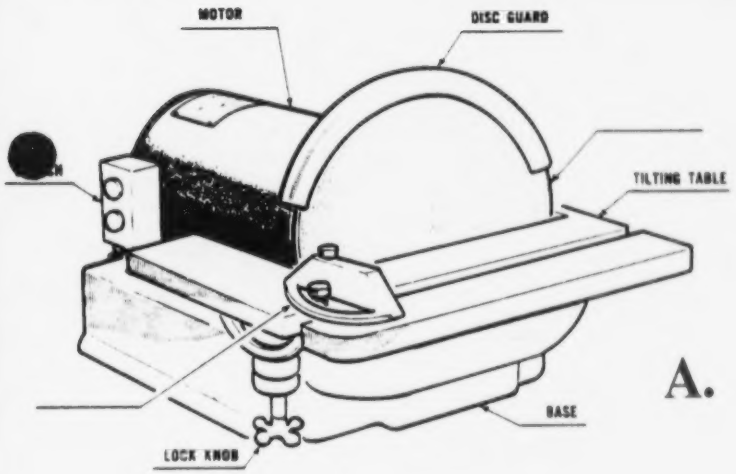

SWITCH
HOUSING
DEPTH ADJUSTMENT
HANDLE
FENCE

C.


HOUSING
SWITCH
DEPTH LOCK
GUIDE KNOB
BASE
COLLET CHUCK

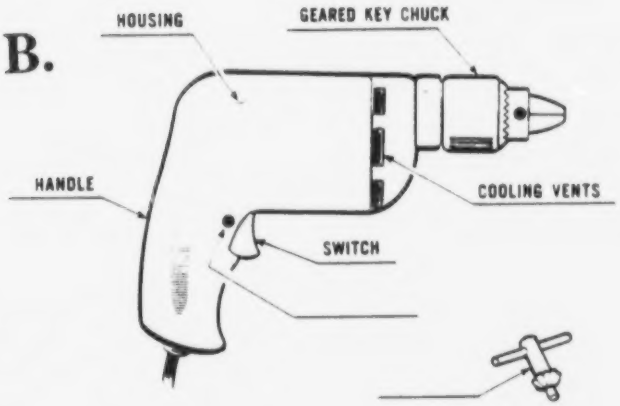
D.

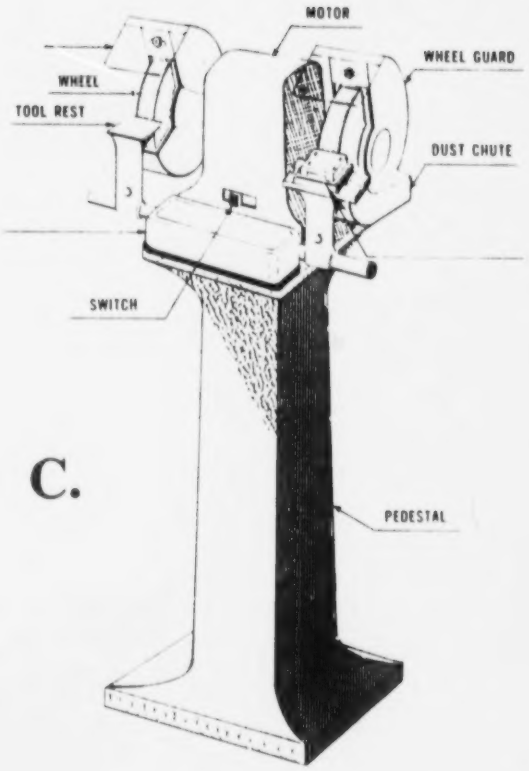

HOUSING
HANDLE
SWITCH LOCK
FRONT KNOB
PAPER CLAMP



A.

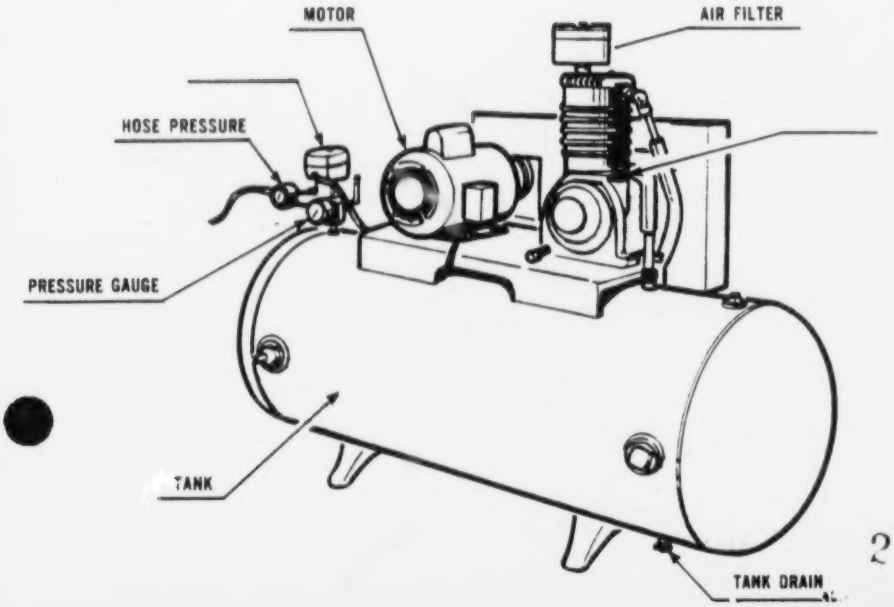
B.





C.

D.



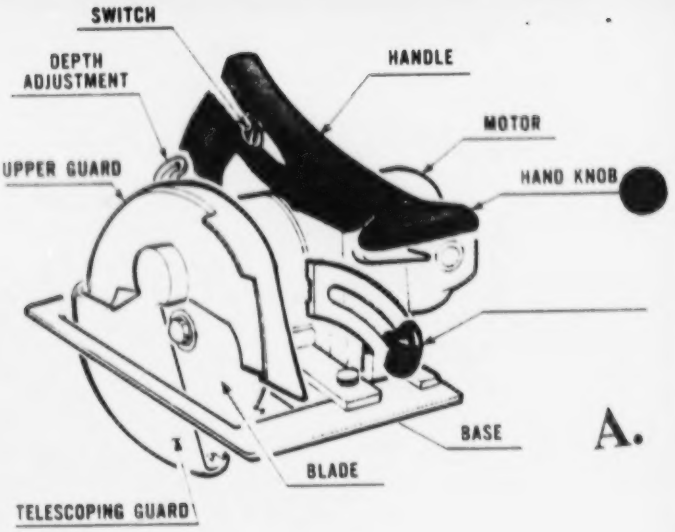
A. _____

B. _____

C. _____

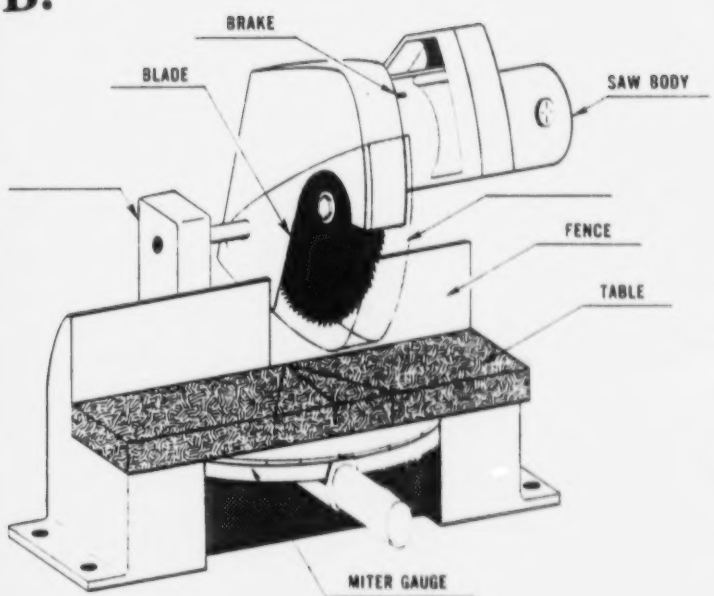
D. _____

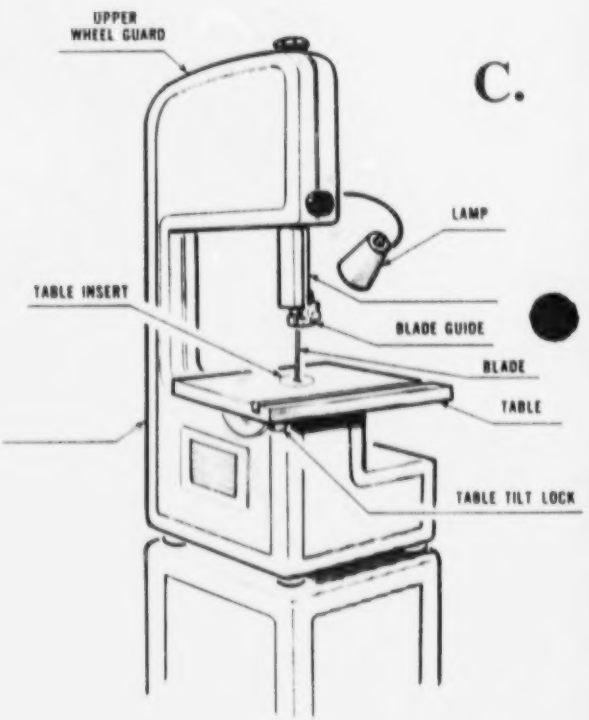
BEST COPY AVAILABLE


SWITCH
DEPTH ADJUSTMENT
HANDLE
MOTOR
UPPER GUARD
HAND KNOB
BASE
BLADE
TELESCOPING GUARD

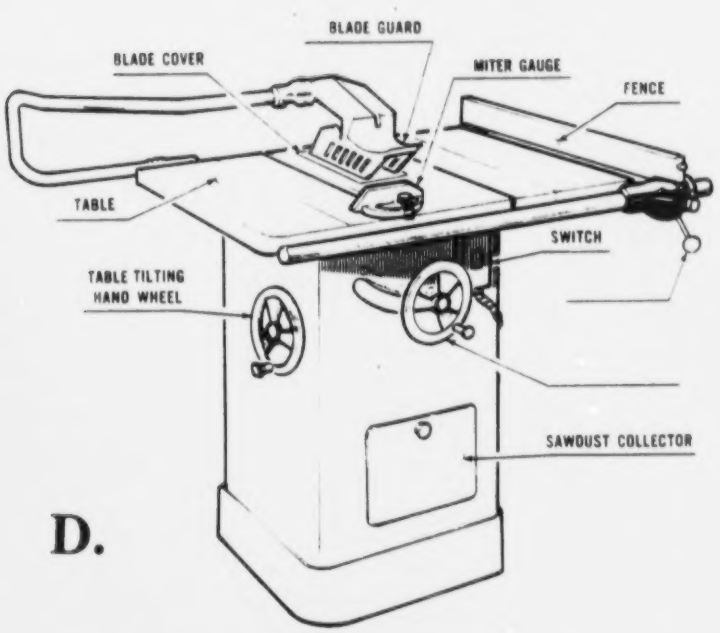
A.

B.


BRAKE
BLADE
SAW BODY
FENCE
TABLE
MITER GAUGE


UPPER WHEEL GUARD
LAMP
TABLE INSERT
BLADE GUIDE
BLADE
TABLE
TABLE TILT LOCK

C.


BLADE GUARD
BLADE COVER
MITER GAUGE
FENCE
TABLE
SWITCH
TABLE TILTING HAND WHEEL
SAWDUST COLLECTOR

D.

A. _____

B. _____

C. _____

D. _____

Bridging

Goal: Apply basic measurement concepts

Input	Elaboration	Output	Checking Strategies	Summary	Other Content Areas	Personal Life
What are some tools of measure?	*What units of measure are involved?*	*What do these tools measure?*	*In what ways can you use these tools?*	*In what ways can you distinguish between the various tools?*	*In what classes would I get experience using these tools?*	*When do I use these tools in my life?*
ruler yardstick tape measure scales protractor odometer thermometer	inches feet yards miles meters centimeters millimeters milligrams pint liter gallon degrees	length weight distance temperature angles	measuring weighing conversion	appearance appropriate usage size	math art geography science home economics Dr. Ed	measuring • construction • cooking • driving a car • sewing • decorating • sports drawing • enlarging • reducing • perspective weighing • health • cooking • buying food balance • tires • cooking • sports temperature • illness • weather • cooking • thermostat • laundry

Instructional Strategy #1
Example: Bridging

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(HLMod9)